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U. S. Department of Agriculture

REPORT OF THE CHIEF OF THE BUREAU OF HOME ECONOMICS, 1937

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF HOME ECONOMICS,
Washington, D. C., September 15, 1937.

HON. HENRY A. WALLACE,
Secretary of Agriculture.

DEAR MR. SECRETARY: I submit herewith the report of the Bureau of Home Economics for the fiscal year ended June 30, 1937.

LOUISE STANLEY, *Chief.*

CONTENTS

	Page		Page
Introduction.....	1	Textiles and clothing.....	10
Foods and nutrition.....	2	Deterioration of wool and cotton during use.....	10
Food composition.....	2	Finishes for cotton fabrics.....	11
Nutrition studies.....	2	Garment and pattern sizes.....	12
Food utilization.....	4	Housing and household equipment.....	13
Economic studies.....	6	Publications and information services.....	14
Consumer-purchases study.....	6		
Adequacy and economy of diets.....	9		

INTRODUCTION

Increased well-being of its people is a fundamental goal of a democracy. Those responsible for public policies, therefore, are concerned with such questions as whether the Nation's productive capacities are adequate and so adjusted as to provide satisfactory levels of living for the entire population—not merely for a small group. To shed light on this question they seek facts as to the income families receive, how these incomes are spent, and whether they are adequate to provide satisfactory family living. They seek also to formulate policies for raising living levels, through efforts of families themselves and through wiser use of our national resources. Formulation of such policies calls for fact-finding along many lines and for governmental research supplementing that of other agencies.

The Bureau of Home Economics, concentrating its attention on families, studies their consumption, the relation between their incomes or ability to buy and their purchases; it evaluates family living both from the standpoint of choices and of market offerings. Its research findings are made effective in improving national well-being in three ways: (1) Through furnishing basic data to agencies responsible for formulating public policies; (2) through pointing out to producers how to fit their programs to people's needs and desires; and (3) through giving facts on food, human nutrition, clothing, and other household commodities and services to families so that they may choose and use goods more wisely.

Especially important to agriculture is the study of incomes and consumption patterns of farm families. The levels of living achieved furnish a yardstick for measuring the success of any agricultural program, for judging whether the land has produced a satisfactory level of living for the population engaged in various types of agriculture.

For administrative purposes the Bureau's work is divided in four categories: (1) Foods and nutrition, (2) economic studies, (3) textiles and clothing, and

(4) housing and household equipment. The publications and information services stem from these four divisions. They represent the Bureau's research, which in turn is unified through its concentration on the goal of higher levels of living for all of the Nation's families.

FOODS AND NUTRITION

The work in foods and nutrition is organized with a view to adding to the knowledge of the specific nutritive requirements of man, and to determining ways of meeting these requirements through intelligent food selection and scientific preparation. Such information is significant for the population because of the relation of diet to good nutrition and general well-being, regardless of the level of food expenditure. It is especially significant in the planning of diets for individuals in public institutions and for families dependent on public aid, when it is important to know what are minimum requirements and how they can be inexpensively met. Scientific knowledge is also needed in correlating actual food consumption with food requirements for the country as a whole.

Investigations are under way to determine the significance in human nutrition of trace elements and other unidentified factors which consistently occur in foods. Methods are being developed for measuring the adequacies of the intake of different vitamins. These methods must be applied by direct studies on human subjects to determine vitamin requirements.

The newer developments in nutrition have emphasized the increased importance of studies showing the relation of various production factors (as cultural conditions, feeding practices, and species and variety of plant or animal) to variations in the nutritive value of foods. Changes in methods of processing and the increase in the number of food products on the market necessitate frequent revision of the data on food composition and indicate the need for new information on food utilization. To keep in step with these changes, the work of this Bureau in foods and nutrition has during the last year been more closely lined up with the work of production branches of the Department.

FOOD COMPOSITION

The objective of the food-composition studies is to bring together and analyze all available data on the chemical constituents of foods insofar as they affect nutritive value. There has been a growing interest in mineral constituents and a recognition of the need for further information on the influence of production factors on these food constituents. From the data that had been collected certain pertinent material was turned over to the Bureau of Chemistry and Soils for use in its study of the mineral composition of foods in relation to soils and soil treatment. Additional unpublished records were assembled and the literature was searched for pertinent authentic data on the mineral content of foods. Calcium and phosphorus were determined in several vegetables for which there were no adequate data.

To meet the need for information on the composition of cooked meats and poultry for use in diet calculations, data on their proximate composition were prepared for publication. This report not only gives the data on composition but also presents a simplified classification of these cooked foods.

There is an urgent demand on the part of individual consumers, nutritionists, dietitians, and physicians for a bulletin on food composition that will serve as a daily handbook. Accordingly data have been brought together and reviewed on a number of cereals and cereal products, several kinds and classes of poultry, nuts, dried and canned fruits and vegetables, cooked meats, and fresh pork. These new food-composition tables with accompanying text will furnish data in practical and usable form, materially better than those now given in textbooks on nutrition and diet.

NUTRITION STUDIES

The need for more exact information on the vitamin requirements of man is indicated by reports that relatively large proportions of the population are affected with subclinical manifestations of vitamin deficiencies. Extensive research is necessary to determine exact human requirements for each of the vitamins. A beginning has been made with vitamin A.

The earliest sign of vitamin A deficiency is revealed by a subnormal rate of visual adaptation to darkness. Studies are under way to determine the daily intake of vitamin A necessary to maintain a normal rate of dark adap-

tation. These studies have indicated the necessity for the development of specific and quantitative methods for the measurement of this rate before extensive metabolic studies are undertaken. Investigations are therefore being made of means by which the adequacy of vitamin A can be determined.

In addition to the chemically identified vitamins several other vitamins are known to occur persistently in a wide range of natural food products. Concentrates of an unidentified factor (or factors) previously associated with the vitamin B complex have been prepared from rice polishings. Studies to determine more accurately the properties and nutritional significance of these unidentified factors will be continued.

Natural food products consistently carry traces of inorganic elements. A special study is being made of the vanadium content of foods and its relation to good nutrition. The United States Public Health Service is cooperating by making histological examinations of the tissue of animals that have been fed different quantities of vanadium. Results so far show that minute amounts of vanadium are tolerated by animals but larger amounts are toxic.

In line with the importance of studying the factors that determine nutritive value of foods, arrangements were made for continuing the study of the vitamin C content of citrus hybrids in cooperation with the Bureau of Plant Industry. Two shipments of fruit were received and analyzed, a part of one shipment being analyzed as individual fruits. There was considerable variation in vitamin C content from fruit to fruit. In certain cases this individual variation was greater than the differences between some of the varieties. Plans are being made to continue the study to determine the factors that influence variation in samples of a given variety.

Studies of ascorbic acid content of citrus hybrids and of home-canned tomatoes have been published. Several brands of commercially canned tomatoes and tomato juice bought on the Washington, D. C., retail market were assayed for vitamin C by the modified technique of Musulin and King. Samples were selected at regular intervals over a period of several months. The vitamin C content of the different samples of a given brand was remarkably uniform.

Studies on the vitamin A, B, and D content of almonds, black walnuts, Brazil nuts, filberts, Persian (English) walnuts, peanuts, and pecans were completed. Vitamin G tests, however, were suspended awaiting further research on vitamin G technique. It is difficult to provide a diet adequate in all factors of the vitamin B complex except in vitamin G (riboflavin). Procedures are under way to free constituents of the diet of traces of vitamin G and to obtain fractions supplying the factors missing in the diet formerly used. These studies should render the technique more sensitive and more specific.

In making vitamin B determinations of nuts, dried yeast was used as a reference substance. This yeast is now being assayed against the International Standard vitamin B. Cooperative work with the vitamin assay committee of the United States Pharmacopeia on vitamin B has continued.

Preliminary studies on the vitamin content of five varieties of soybeans showed soybeans to be good sources of vitamins A and B. Assays for other vitamins and on additional varieties will be made when adequate plans can be developed through a cooperative arrangement with the Bureau of Plant Industry for obtaining fresh samples of a number of varieties for testing, and when a more satisfactory vitamin G technique has been worked out.

Studies were initiated to determine the losses of vitamins A, B, and C in vegetables cooked by different methods. Carrots were selected for the first studies.

Samples of brown rice and puffed rice prepared from the corresponding lot of rice have been assayed for vitamin B. The brown rice samples assayed fairly high in vitamin B, while the puffed rice contained very little of this factor.

The compilation of data on the vitamin content of foods was completed to 1936 and published by the Department. This includes a summary of the chemistry of vitamins, units of measurement, quantitative aspects in human nutrition, and occurrence in foods. The compilation of such data will be continued so that this publication may be revised periodically.

A beginning was made on assembling records on research in home economics in nonland-grant as well as land-grant institutions, in cooperation with committees of the American Home Economics Association and the Association of Land-Grant Colleges.

FOOD UTILIZATION

The research of the food-utilization section has continued along three lines: Investigations of food quality, and principles and methods of food preparation and of food preservation.

MEAT-QUALITY STUDIES

In the study of meat quality, the long-time cooperative project with the Bureaus of Animal Industry and Agricultural Economics and various State agricultural experiment stations, over 600 cuts from experimental animals were cooked. The object was to determine the loss of weight during cooking and the palatability of the meat as affected by the breed, sex, feed, and age of the animals and by different methods of ripening, curing, and storing the meat.

The results of a study of the relation of degree of finish in cattle to factors of palatability showed in general a progressive improvement in the meat associated with increase in fatness. Another study showed that retarding the growth of lambs made the meat less desirable in flavor. Lambs fed grain with roughage rations in restricted amounts produced less tender meat than those full-fed the same ration.

The study of factors that influence cooking shrinkage and cooking time of meat was continued. Data obtained in experiments on 600 rib roasts of beef were examined to show the role of water content, fat content, temperature of a roast when put into the oven, weight, style of cutting, and cooking temperature. Cooking temperature influenced shrinkage and cooking time more than did any of the other factors studied. In general, the higher the oven temperature, the greater was the shrinkage of beef and the more rapid the cooking. Also, the more thoroughly the beef was cooked, the more it shrank and the longer was the time required.

For example, when constant-temperature roasting methods were used, with oven temperatures ranging from 125° to 235° C., the shrinkage of standing and rolled roasts cooked rare at the center varied from 9 to 32 percent and required from 34 to 13 minutes per pound. Similar cuts cooked well-done with oven temperatures ranging from 125° to 175° C., shrank from 20 to 35 percent and required from 52 to 27 minutes per pound.

When roasting methods included initial searing at high temperature and the oven temperature for finishing the cooking varied from 125° to 225° C., shrinkage ranged from 11 to 24 percent and time from 45 to 13 minutes per pound, for standing and rolled roasts cooked rare at the center. Cooked well-done by a quick-sear and moderate-finish method, standing and rolled roasts shrank from 20 to 33 percent, and required from 61 to 28 minutes per pound.

EGGS

Through a cooperative arrangement with the Bureau of Animal Industry, eggs of known freshness from hens on a known diet were provided from the experiment farm at Beltsville, Md. The whites of these eggs were used for measurements of the volume and stability of foams beaten for different periods using thin, thick, and whole egg whites with total solids content adjusted to 8 and 12 percent. The results showed that 90 seconds, under the conditions of the experiment, gave foams having the best texture and approximately the optimum volume and stability.

The addition of cream of tartar and salt, in quantities used in foams for angel-food cakes, to egg whites of the types described above produced foams of greater volume and stability. The 90-second beating time was also found to be most desirable for these foams.

POTATOES

The studies on potatoes made cooperatively with the Bureau of Plant Industry to determine the influence of production factors on table quality have continued. The results of the study of quality of potatoes in relation to cultural methods showed no relationship between depth of planting and table quality.

The varietal-selection study included judgments for cooking quality of 8 commercial varieties and 10 seedlings produced by the Bureau of Plant Industry, which field tests have shown to have commercial possibilities. Data are being accumulated to show variations in cooking quality of certain commercial varieties of potatoes from year to year.

Comparative cooking tests were made on 13 lots of Irish Cobbler and Green Mountain potatoes to determine the effect of varying ratios of potash on internal blackening following cooking. The results did not show a clear-cut influence from the potash in the soil.

SOYBEANS

Cooperation with the Bureau of Plant Industry in providing different varieties of soybeans for quality tests has continued. This year nine varieties of soybeans and flour made from them were supplied. Our study showed that, of these nine varieties, some made a more satisfactory flour for use in baked products than others. Biscuits and muffins in which 50 percent of the flour was soybean were considered to be very good when made from five of the varieties of beans. The beans which retained a green color when mature did not make desirable flours.

BREAD

The Food Utilization Section continued its cooperation with the departmental committee appointed in the summer of 1935 to study factors that contribute to the flavor of bread. Last year 96 individuals tested bread, using the consumer-preference method of judging as summarized in the 1936 report. It seemed desirable this year to test a number of individuals for their acuity of sense of taste and of smell, in order to obtain a reliable panel of judges for the bread study. To test sensitivity of taste 64 prospective judges evaluated their sensations and identified in duplicate solutions of chemically pure sodium chloride, sucrose, lactic acid, and caffeine, tasted in order of increasing strength. To test acuity of sense of smell, they identified by odor eight familiar substances. Elimination of individuals who lacked consistence in taste sense and acuity-of-smell sense reduced the group to 25 persons. This group was tested further to establish its discriminatory powers by having each person rate in duplicate bread samples containing different quantities of sodium chloride, sucrose, lactic acid, and caffeine, respectively. Using this method to eliminate the indiscriminating persons reduced the final panel to 14 members.

Analyses of the data on the identification of the chemically pure solutions showed no cases of taste blindness for any one of the four substances. Smoking, age, and sex did not have a significant effect upon the individual thresholds for sweet, salt, acid, or bitter.

The results of these tests of the acuity of sense and smell are significant not only in connection with the selection of judges for the bread study, but also because they point the way to a suitable method of setting up a panel of judges for other food-quality studies.

COMMERCIALLY PREPARED FOODS

A comparison of homemade versus commercially-prepared ice-cream mixes, starch and gelatin puddings, gingerbread, devil's-food cake, and quick bread mixes, showed that in general, the homemade were better than the commercially-prepared mixtures. Flavor was the quality factor which gave low scores to many of the commercially-prepared products, but usually poor flavor was accompanied by inferior appearance, texture, or consistency, and color. The time of preparation of the commercially-prepared products as compared with the homemade varied with the complexity of the recipe, but was always less with the commercially-prepared foods.

There was no relationship between the cost and quality of the commercially-prepared foods. In many cases the cheapest product produced the highest quality. The cost range for a prepared unit of the same product from different brands was wide. Except for very few products, the cost of the commercially-prepared products was greater than the homemade.

CANNING

The study of the effect of the length of the canning process on the quality of beef was continued, using similar muscles from the round of beef. The processing periods compared were: No. 2 cans for 60 minutes and for 85 minutes at 250° F. The results confirmed those of the previous year, in that there was little difference in the quality of the canned meat from the same muscle when processed the two different periods.

ECONOMIC STUDIES

CONSUMER-PURCHASES STUDY

The promotion of family well-being, one of the chief functions of home economics, is contingent on definite knowledge of existing conditions and on possibilities for improvement. Our knowledge of prevailing levels of living has been greatly increased during the year through study of the consumption of families in different sections of the country, as influenced by income, family type, occupation, and degree of urbanization.

In this study, a Federal Works project sponsored by several Federal agencies, facts have been accumulated on income and household composition from random samples including almost 20,000 families in 19 small cities, 23,000 families in 140 villages, and 35,000 farm families in 19 farming areas. From a controlled sample within these groups data have been obtained on expenditures for the chief goods and services used from more than 35,000 families; on the kinds and quantities of food consumed during the week preceding the interview from about 17,000 families; on clothing purchases for different members of the family, from almost 22,000 families; and on furnishings and household-equipment purchases from 24,000 families. The expenditure study was limited to native-born nonrelief families having both husband and wife. Only white families were studied except in the Southeast where Negroes also were included.

The analysis of these data is well under way. Preliminary releases consisting of tabular material with explanatory statements have already been issued in mimeographed form for the use of governmental agencies and others wishing to make immediate use of the findings. The preparation of final reports is well advanced. The first publications will present by regions data on the expenditures and income of families in small cities and villages, and on farms.

Of particular interest to various governmental agencies are some of the details of the new data on farm-family income. There have never been satisfactory figures on the income of farmers from nonagricultural sources. As a result of this study there will be available for selected areas in each of 21 States figures on the net money income from nonfarm sources, as well as information on the money and nonmoney income from the farm.

In table 1 is shown for a few of the areas studied the average total income of nonrelief families who were not "in the red" in 1935-36, and the distribution of this income according to source. The sample included native unbroken families on farms for at least 1 year. They were white families except in the Southeast.

TABLE 1.—Average total income of nonrelief farm families in specified localities, by source of income

State and county	Average size of family	Average income				
		Total (money and non-money)	Non-money (from farm)	Net money income		
				Total	From farm	From other sources
	<i>Persons</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>
Ohio: Crawford, Knox, Richland.....	3.9	1,365	572	793	599	194
Pennsylvania: Lancaster.....	4.7	1,661	647	1,014	742	272
Iowa: Madison, Mahaska, Marion, Marshall, Poweshiek.....	3.9	1,149	536	613	541	72
North Dakota: Barnes, Cass, Griggs, Steele.....	4.5	915	570	345	285	60
North Carolina: Macon, Jackson.....	5.2	1,004	610	394	87	307
South Carolina: Darlington, Florence (Negro).....	6.7	667	349	318	270	48

The average total income during 1935-36 ranged from more than \$400 per capita yearly, in Pennsylvania, to less than \$100 among South Carolina Negro operators; the average per capita cash income ranged from \$250 (Pennsylvania) to \$46 (North Dakota). In the commercial farming areas listed in table 1, the money from nonfarm sources amounted only to one-sixth or one-fourth

of the total money income, but in self-sufficing farm areas it was the major source of cash.

Nonmoney income from the farm consists not only of the value of products furnished by the farm for family use but the change in value of crops stored for sale and of livestock inventories, and also of an imputed value of the occupancy of the farmhouse. This nonmoney income amounted to as much as \$160 per capita yearly in a general farming area (Pennsylvania) but only to about \$50 yearly per capita among Negro farm operators (South Carolina).

Accompanying these wide differences in income there are, of course, wide differences in the levels of living prevailing in these several areas. The opportunity for choice in consumption is greatly increased as purchasing power rises. Though farm families are less dependent on money income for livelihood than are urban dwellers, because of the opportunities for obtaining goods directly from the farm, there is a limit beyond which live-at-home programs should not be pushed in industrial economy.

In most areas studied, the farm-furnished food made considerable contribution to real income, averaging in value \$250 or more per family. More than two-thirds of the families had their own eggs and poultry. Outside of California and the Southeast about two-thirds of them had their own milk. Except in California and the drought-stricken Middle West, half or more of the farms had potatoes and some other garden truck.

Farm-furnished food, providing as it does many of the protective foods which are costly to produce but even more costly to buy, helps to give farm families an advantage over urban dwellers when it comes to dietary adequacy. Three-fourths or more of the dietary records obtained from farm families in the North and West have been classified as grade A or "good" on the basis of their protein and mineral content; only 30 to 50 percent of the dietary records from village and city families in the same regions were equally satisfactory. In the South, diets of white farm families were better nutritionally than those of white families in southern villages and cities. Negro farm families had better diets than Negro village or city families.

Income variations within a single region are fully as great as between regions. In the wheat-farming sections of Kansas and North Dakota, for example, some families went in the red in 1935-36 while the total family incomes of others exceeded \$4,000. About one-fifth of the families with positive incomes spent more for family living than they made, drawing on credit or savings for the difference. Expenditures for family living in this region ranged from about \$600 in the lowest income brackets to almost \$1,300 in the highest. With this doubling of expenditures for family living, the expenditures for each major item were also increased, but for some items far more than for others. This differential spending indicates to a certain extent the manner of living of different income groups. Average expenses for the family car were practically trebled when total expenditures doubled, and so were expenditures for recreation, formal education, as well as for gifts to persons outside the family, community welfare, and taxes. Average expenditures for clothing, personal care, and medical care doubled, whereas expenditures for food and household operation increased considerably less than 100 percent.

In most of the farm areas studied, the modal total income for nonrelief families was \$750 to \$999 in 1935-36. At this income level, farm families in Kansas and North Dakota spent an average of \$723 for family living. Of this, \$209 went for food to supplement what was home-produced (valued at approximately \$300). The average total food supply was valued at about \$115 per person yearly. Probably at least half of the families at this level were enjoying fully adequate diets. Clothing for the entire family cost scarcely \$100. Fuel, light, ice, domestic help, and the incidental expenses of household operation took an average of \$108, or about \$15 out of every \$100 spent. In this group, medical service and medicines for all members of the family cost \$59, and constituted the fifth largest item in the budget. This amount is nearer the \$50 spent per family by the income group spending least for family living than to \$100, the amount spent for this item by families in the highest income bracket.

Twenty-seven dollars was spent on recreation, and covered everything from Saturday-night movies at a nearby town to children's toys, purchase and repair of the radio, club dues, and sport equipment. About \$7 was spent on books, magazines, and newspapers, and \$8 on schoolbooks and other incidental expense of children's education. Personal taxes, gifts to persons outside the family, and contributions to community welfare amounted to \$31 yearly.

These amounts are less than half of what was spent for these items by the more well-to-do families in the community.

So far the only analyses made of the data secured in small cities (8,000 to 15,000 in population) are those concerned with income and housing. Facts about expenditures will come later.

In most of the small cities in the North and West average incomes were between \$1,200 and \$1,600 yearly. In Westbrook, Maine, many families achieved higher-than-average incomes in 1935-36 through the pooling of earnings by several family members. Nearly one-third of all Westbrook families and almost half of those with incomes above the average (about \$1,500 for the year) had more than one breadwinner. This finding of many families with several earners in Westbrook, a manufacturing center, is in sharp contrast with the situation in Boone, Iowa, a trading center for an agricultural community, where only 1 out of every 10 families had more than one earner, and where the average family income was about \$1,300. In Greeley, Colo., an educational and commercial center, average incomes were almost \$1,600, in spite of the fact that more than three-fourths of the families had only one earner.

In Greenfield, Mass., about one-third of the families owned their homes and most of these were in the higher income brackets. Rentals paid averaged about \$24 per month in this manufacturing city. In New Philadelphia, Ohio, where about half of the families owned their own homes, average rentals were only \$14 monthly. Here close to 90 percent of the families lived in detached houses. In Westbrook, Maine, where rentals averaged \$24 monthly, less than half of the families lived in detached, one-family houses. Over one-third lived in two-family dwellings, and the remainder in apartments and other types of living quarters.

The first broad view of village family expenditures for living is made possible by comparing figures from two diverse parts of the country—the Pacific coast and the Southeast. At each income level the proportions spent for food are about the same in the two regions, but in the Southeast more money is spent on clothing and household operation, especially household helps, and less on automobiles. On the Pacific coast the comparatively high expenditures for automobile purchase and upkeep suggest that travel is a preferred form of leisure-time activity. When village wage-earner families attain an income of \$1,000 and when business and professional families reach \$1,500, more is spent on the automobile than any major item except food; there is a greater increase in automobile expense as income rises than in expense for any other group of items.

Within a region expenditure patterns differ greatly from one income level to another. For example, a fivefold increase in total expenditures for family living by business and professional families in southeastern villages was accompanied by a sevenfold increase in expenditures for medical and personal care; a ninefold increase in expenditures for clothing; a tenfold increase in expenditures for reading and education; a seventeenfold increase for recreation; a twentyfold increase for the family car; and a twenty-sevenfold increase for gifts to persons outside the family, community welfare, and taxes. In contrast to these figures, expenditures for food increased only about fourfold and for household operation, only about threefold. These variable rates of increase in expenditures for various goods and services with rising total expenditures for family living throw some light on the extent to which needs and desires are met at the lower expenditure levels.

Impossible though it is to classify families into definite categories of "adequacy of living" by inspection of pay checks and ledgers of family expenses, nevertheless, expenditure patterns at different income levels do throw some light on the matter. There is little question, for example, that when even as much as 50 percent of a \$600 income for a city family of five goes for food, the amount is still too little to insure adequate diets for every family member. And on such incomes little can be left, after meeting the most urgent requirements of physical maintenance for those items which enhance the human values of living.

Through this study of family expenditure patterns and of consumption habits it is hoped to develop objective criteria by which to evaluate the relative planes of living which family budgets afford under different conditions. For food, some scientific criteria already are available to assist in the evaluation of the nutritive qualities of diets. These are being applied to the data on food consumption secured from farm, village, and city families in the course of the study of consumer purchases.

ADEQUACY AND ECONOMY OF DIETS

During the year a study of the adequacy and economy of diets of employed city workers was completed. The results indicate that more money for food and a more effective application of present knowledge of food and nutrition to food selection are necessary if higher levels of nutrition are to be more generally attained by low-income city families.

The 3,500 dietary records from city families in different parts of the country on which this analysis was based were put at our disposal through the courtesy of the United States Bureau of Labor Statistics; statistical assistance was made available through the Works Progress Administration. The results of the study indicate that few families spending less than \$1.50 per capita a week in 1935 obtained diets adequate for average health. The great majority of families spending \$3.75 or more per capita a week were buying food in sufficient quantity and variety to provide high-grade diets. But whether good, fair, or poor diets were obtained by families spending between \$1.50 and \$3.75 weekly per capita depended on their food choices.

The quantity of food and the nutritive value of family diets increased with the amount spent for food. The market baskets of the low-expenditure families contained almost as much grain products, potatoes, and fats other than butter as those of high expenditures. Families spending more for food bought much more milk, butter, eggs, meats, and the succulent vegetables and fruits. Per capita consumption of these latter commodities often more than doubled between the lowest and highest expenditure groups. There were marked increases in per capita consumption of the so-called protective foods, milk, and green leafy vegetables as more money was spent for food. These foods supply the calcium and vitamin A which were found in inadequate quantities in many of the low-cost diets.

There are significant differences in the amounts spent for food by city wage-earning families in different parts of the country. More than one-third of the families in North Atlantic and Pacific coast cities were spending less than \$2.50 per capita a week for food during 1935. So were two-thirds of the southern white and five-sixths of the southern Negro families. About one-fifth of the families in North Atlantic and Pacific coast cities were spending more than \$3.75 per capita a week. Only 6 percent of the southern white and less than 3 percent of the Negro families were spending this much.

Many families spending between \$2.50 and \$5 per capita a week for food were found to be obtaining high-grade diets likely to promote good health and efficiency. Well over half of the families in the North Atlantic and Pacific coast cities but less than one-third of the southern families were spending this amount for food.

About one-fifth of the families studied in North Atlantic cities were obtaining food supplies affording only low-grade diets from the nutritive standpoint. One-eighth of the Pacific coast families, 40 percent of the southern white families, and 70 percent of the Negro families were on a low dietary level. The majority of these low-grade diets, however, were those of families spending less than \$2.50 per capita a week for food.

Diets of families spending less than \$2.50 per capita a week tended to provide smaller allowances of the minerals and vitamins than are considered necessary for good nutrition. The most common shortages seemed to be in calcium, iron, and vitamins A, B, and C.

Regional differences in the consumption of certain foods were more definitely marked among families on the lower expenditure levels than among those spending adequate or liberal amounts for food. North Atlantic families tend to buy more milk, butter, beef, lamb, and potatoes than do southern white families, but less of other vegetables and fruit, fewer eggs and poultry, less pork, and less flour. North Atlantic families buy more grain products than do Pacific coast families, more poultry, pork, and potatoes, but they buy less of other vegetables and fruits.

Racial background also makes a difference. White families in the South buy more eggs and milk but less meat and flour than Negro families in the same region spending comparable amounts for food. The country over, families spending a small amount of money for food use only a small quantity of milk. In the South, where expenditures for food are lower than in the North and West, milk consumption drops accordingly. But southern white families buy as much milk as white families in other regions when their food expenditures are the same. This puts a new light on the problem of milk consumption in the South.

In addition to this research now under way, data from other studies have been put into form for publication. A summary of family living in Knott County, Ky., is now in press. This depicts the effect upon the material conditions of family life of the farming of land much of which is below the margin of profitable cultivation. It was one of a series of studies made in cooperation with other agencies to afford a basis for the development of economic and educational policies in the southern Appalachian highlands.

Also work has proceeded in the formulation of guides to budgeting for low incomes, and in the preparation of material to assist housewives in buying food more wisely. Such information is particularly timely when many States are faced with the problem of defining, in connection with new minimum-wage legislation, what wages are necessary to provide "adequate maintenance and protection of health."

TEXTILES AND CLOTHING

The textile work has, as hitherto, been focused upon research related to the serviceability of fabrics in terms of consumer use and to the development of more adequate buying guides for household buyers.

DETERIORATION OF WOOL AND COTTON DURING USE

Results of a serviceability test on blankets made from four blends of wool have been published which report a cooperative study with the Bureau of Animal Industry comparing the serviceability of various combinations of fine, $\frac{1}{2}$ -blood, $\frac{3}{8}$ -blood, $\frac{1}{4}$ -blood wool, and reworked wool.

The effect of three laundering procedures upon three of these blanket fabrics was also investigated and compared with the deterioration produced by wear plus laundering. In general, both repeated laundering alone and service plus washing caused a decrease in the strength index, air permeability, sulphur and nitrogen content, and the resistance to bacterial attack of the fabric, and an increase in weight per square yard, thickness, thread count, moisture and ash content, methylene blue absorption, and fiber scale breakage. However, every physical and every chemical test for measuring deterioration showed that wear plus laundering caused more damage than merely repeated laundering. This is significant in view of the fact that some laboratories are now judging the serviceability of fabrics by tests involving only repeated laundering. The amount of shrinkage of the blanket was found to be dependent on the fineness of the wool as well as on the laundry procedure.

Another cooperative study with the Bureau of Animal Industry on the use value of various qualities of American-grown wools has been started. Blankets were manufactured from good, $\frac{3}{8}$ -blood, Idaho wool combined with varying amounts of good and poor qualities of reworked wool. They were put into service in a Washington hospital. Samples will be withdrawn at regular intervals, and the deterioration measured chemically and physically.

A study of the deterioration of wool fabrics by micro-organisms is being undertaken cooperatively with the Division of Soil Microbiology of the Bureau of Plant Industry, and the initial report is in press.

In this investigation, a number of sterilizing methods were tested to determine the one most satisfactory for subsequent bacteriological studies on wool fabrics. The deterioration produced in a wool fabric by these sterilizing treatments was measured by strength index, weight, thickness, flexural properties, sulphur and nitrogen content, methylene blue absorption, and scale breakage.

It was found that ultraviolet light, potassium permanganate, iodine, alcohols, glycerol, tribrombetanaphthol, and tetrachlorethane did not give sterility under the conditions of the experiments. Although sodium phenylphenates prevented growth, they did not kill the organisms. Formaldehyde and mercuric salts gave sterility, but were retained by the wool and therefore made the fabrics unsuitable for subsequent bacteriological studies. Intermittent steaming and dry and wet autoclaving produced sterility but deteriorated the fabric to such an extent as to interfere with its serviceability. Heating in xylene, Stoddard solvent, or tetrachlorethylene gave satisfactory results from the bacteriological standpoint and also left the fabric essentially unchanged.

As an outgrowth of this investigation application has been made for three public service patents. These patents concern the sterilization of fibrous materials of animal origin by the use of heat combined with xylene, with Stoddard solvent, and with tetrachlorethylene.

A report covering the study of the serviceability of sheetings made from cottons grown under irrigated and nonirrigated conditions is being prepared. As measured by physical and chemical tests, the sheeting made from irrigated cotton was more deteriorated initially and throughout the service period than sheeting made from nonirrigated cotton or from a mixture of 20 percent of irrigated with nonirrigated. Fluidity measurements of cuprammonium hydroxide solutions of the cotton of the unlaundered sheets made each year for a period of 4 years show that chemical deterioration increased progressively with storage.

Through a cooperative arrangement with the Bureau of Agricultural Economics sheets have been made of Middling cotton of 14/16-, 15/16-, and 1-inch staple length. They are being used in a local hotel and washed in a commercial laundry. Sheets from each of the three lots will be analyzed after each 25 periods of wear and laundering.

The role played by micro-organisms in the deterioration of cotton fabrics is being investigated in cooperation with the Bureau of Plant Industry. A bleached and an unbleached cotton duck fabric have been inoculated with *Chaetomium globosum* and *Spirochaeta cytophaga*. The damage caused by these organisms is being estimated by measuring changes produced in the physical and chemical properties of the fabrics.

An annotated bibliography of references on the chemical testing of textiles was published in cooperation with the American Home Economics Association. It contains references to articles published in English, German, and French from 1920 to 1937, on qualitative and quantitative chemical methods of testing fibers and fabrics.

FINISHES FOR COTTON FABRICS

In order to get further information concerning the effect that starches and sizing mixtures produce on yarns and fabrics it was decided to study first the properties of dried films of starch independent of yarn and cloth. Therefore measurements of the pliability, stretch, and breaking strength of dried films of various starches used alone and when combined into sizing mixtures were obtained. Further tests were then made to relate this information to starch films applied to cloth.

These investigations were carried out on corn, wheat, rice, canna, dasheen, potato, and sweetpotato starches. Borax and glycerin in the proportions commonly used in sizing mixtures were added and their effects noted. A double-sulphonated castor oil and a neutral soap were also added to corn-starch. Because gelatin is often used as a sizing material the properties of its dried film were also measured.

The test for the pliability of starches involves holding a strip of film under definite tension and bending it back and forth around a curved surface until failure occurs. For all the starches the pliability decreases as the film thickness increases. The thicker the film the more brittle it becomes and the less folding it will stand. Canna starch films have the greatest pliability, potato films are next, then sweetpotato, corn, rice and wheat. Dasheen films are the least pliable. The gelatin film is more similar to canna starch film than to the other starches studied although it has considerably greater pliability. The addition of glycerin to a starch paste lowers its film pliability the least; then come, in order, the sulphonated castor oil, castile soap, and lastly borax. Borax makes starch films very brittle so that the films containing it fold very few times before breaking. The lowering of the pliability by glycerin, sulphonated castor oil, and castile soap is probably due to a softening of the film rather than to an increase in brittleness.

The breaking strength of starch films and the stretch at the breaking load were also obtained. The results show that all the starches get stronger as the film thickness increases. However, the increase in strength is greater for some starches than for others. At the average film thickness for each starch the potato-starch film is the strongest, canna is next, then sweetpotato, rice, corn, dasheen, and wheat. This same order was also maintained for the total elongation of each starch at its average thickness. In general small amounts of borax give greater strength to films than small amounts of glycerin but increasing amounts of borax greatly lower the breaking strength of films. Increasing amounts of glycerin produce little effect on strength of films, although the tendency is to weaken them. The addition of a sulphonated castor oil and a good grade of castile soap to starch pastes made the films stronger. Gelatin films are much stronger and stretch more than starch films.

The relationship between these various properties of dried films of starch pastes with the properties of starch films when applied to yarns and cloth was studied next. Measurements of stiffness, breaking strength, and elongation were made on fabrics sized with the various starches and sizing mixtures. Because stiffness affects the resistance of a fabric to bending it is interesting that these stiffness results compare very well with the pliability (or folding endurance) results obtained for the starch films. Favorable comparison may also be made between these cloth-strength results and the film-strength results. Further analysis and comparisons are being made and a detailed report is being prepared.

QUALITY GUIDES FOR PURCHASERS OF CLOTHING AND HOUSEHOLD TEXTILES

As an outgrowth of the laboratory analysis and service tests on cotton and wool fabrics, buying guides for consumer use have been prepared on sheets, blankets, and bath towels. A classification of sheetings into five groups with a minimum specification for each has been proposed as an aid to household buyers in judging quality.

Various types of upholstery have been purchased and analyzed. These data will be used as a basis for proposing minimum specifications which will serve as a purchasing guide for two grades of friezes, damasks (including brocades), and rib weaves.

A similar study on the qualities of cotton broadcloth is in progress. This is a part of the work on the development of definitions for fabrics carried forward in cooperation with the American Society for Testing Materials.

The earlier contributions on fabrics and designs for children's clothes have been brought up to date and prepared for publication under one cover. This new bulletin will meet the many requests of nursery-school directors and child-welfare clinics for information on children's clothing in line with modern ideas of child hygiene and habit training. Commercial patterns are available for six of the designs illustrated.

A set of nine charts dealing with the principles of clothing selection has been issued for use by extension workers and leaders of adult-education groups and placed on sale by the Superintendent of Documents.

The consumer buying helps have been in great demand. Twelve photographic folios are on continuous loan schedules. These suggest points to look for in selecting various items of clothing and household textiles. The most recent folio deals with women's hosiery.

In cooperation with the Extension Service, exhibits of clothes for 4-H club girls and of household textile items were prepared for use in the judging contests which are a part of the National 4-H Club Congress held in Chicago each year. Since then the exhibit of clothes has been circulated to State 4-H club leaders who requested it for use in their State programs. A new 4-H club girl's uniform was designed and cooperation was given to the two commercial companies who made the patterns. In addition to the 4-H club exhibit, two traveling exhibits of children's clothing and one of clothes made from used materials have been maintained and circulated. During the year, 60 loans of these exhibits were made. This service has been used by 42 States, Alaska, and the District of Columbia, and many additional requests could not be accommodated.

The study of the labeling of textiles and clothing as one means of supplying consumers with guidance in textile selection has been continued. Posters showing current labels are lent to study groups, and special displays are prepared as needed for cooperation with retailer-distributor meetings.

GARMENT AND PATTERN SIZES

Under an allotment from the Emergency Relief Appropriation of 1937 and through the cooperation of the Works Progress Administration and the National Youth Administration, the Bureau has been enabled to initiate a study of the body measurements needed as a basis for children's garment and pattern sizes.

This study is under way in eight States and the District of Columbia, in cooperation with the following institutions: University of Alabama; Institute of Child Welfare of the University of California; Iowa Child Welfare Research Station of the State University of Iowa, working with the Iowa State College of Agriculture and Mechanic Arts; Kansas State College of Agriculture and Applied Science; University of Minnesota; Pennsylvania State College; and Agricultural Experiment Station of Texas, working with the Texas Technological College. The Bureau is in direct charge of the work in the District of Columbia and in Maryland.

As is also true in the case of clothing for adults, heretofore no scientific study has been made of the measurements of children, as a basis for sizing clothing and garment patterns. As a result, the proportions used today for ready-made clothing and for patterns are not uniform, and in many cases little relation exists between the dimensions used and human measurements. The age sizes marked on children's garments very rarely correspond with the dimensions of children of that age. The lack of any scientifically determined body measurements which can be used as a standard has also made possible the practice of skimping on the size of garments in order to meet competitive prices. This has added to the confusion until today it is almost impossible to purchase a child's garment satisfactory in size without taking the child to the store to be individually fitted.

Each State institution cooperating in the project has appointed a State director to arrange for measurements to be taken within that State. Scientifically trained persons work under the supervision of these directors. A manual of procedures to be followed has been prepared and instruments calibrated by the National Bureau of Standards are supplied. Thirty-six measurements determined in consultation with garment distributors and manufacturers, are being taken on each child. An effort is being made to measure 100,000 children over a wide geographic area. These will be representative of both sexes, two economic levels, and age groups from 2 to 14 years.

The measurements are taken by squads composed of persons trained in the technique to be followed and assisted by workers from the Works Progress Administration and the National Youth Administration. The consistency of the results is determined by duplicate measurements which are taken from time to time; also by checkers sent out from headquarters to insure that all workers are adhering to the same standards of procedure.

HOUSING AND HOUSEHOLD EQUIPMENT

As a background for improvement of rural housing, a summary of data collected from 46 States as a Civil Works Administration project are being prepared for publication. Help was obtained from the Works Progress Administration in the preparation of the statistical summaries. Also in cooperation with the Oregon State College of Agriculture, a study has been made of special requirements of rural housing in different sections of the country. This material should be of value to architects and builders as well as extension workers, teachers, and rural homemakers.

A conference was called of representatives from six State experiment stations working in the field of household equipment for the purpose of planning experimental studies cooperatively so that the greatest amount of information can be made available in the shortest period of time. This group outlined a series of publications on household equipment into which Federal and State contributions will dovetail.

The study of different fuels used for cooking, initiated in cooperation with the Bureau of Agricultural Engineering, was continued and the cooking tests have been completed. Bottled gas, gasoline, kerosene, manufactured gas, and electricity were the fuels studied. Two typical ranges were used in each case except with the gasoline, which was tested in only one range. The data are being analyzed to determine which results were due to the particular design of the stove and which to the fuel.

Based on the total consumption of heat energy required in cooking 6 days' meals, electricity proved to be the most efficient. In terms of energy units bottled gas used 1.78, kerosene 1.82, manufactured gas 2.02, and gasoline 2.91 times as much as electricity for the same cooking. Menus of three cost levels were used—liberal, moderate, and low cost. Comparing them on the basis of cost of cooking, the moderate-priced meals for 2 days cost 1.16 times as much to cook as the low-priced meals, and the liberal meals 1.18 times as much as the low-priced meals. Summing up the time required for the individual cooking processes in each meal, on the average the moderate-priced meals took 1.32 times and the liberal meals 1.15 times the period required for preparing the low-cost foods in these particular menus. In planning menus for families of restricted income, these figures may be useful as a rough indication of the relative importance of the time required and fuel cost of the cooking.

The section on equipment in the bulletin on home laundering has been revised and enlarged to cover the newer kinds of electric equipment particularly. The revised bulletin is now in press.

Continuing the work previously begun, no-load tests of four more household refrigerators have been made. The results of these few tests agree with the statement commonly made that more recent models use considerably less electrical energy than did the models of a few years ago.

An accelerated life test was carried out for four refrigerators. Two ice-cooled cabinets and two electric refrigerators which had been tested when new were then operated for 90 days in a room at about 100° F. and 85 percent relative humidity. The manufacturers usually take the cabinets apart immediately after this 90-day period in order to find the weak points and thus improve their product. The aim here was to examine the effect of such a period on the overall performance of the units; hence they were retested according to the original method. One ice-cooled refrigerator maintained about the same average temperature but melted about 4 percent more ice. In the other the average temperature rose about 1°, while the ice-melting rate increased about 7 percent. Because of absorption of moisture by the insulation the cabinets gained in weight about 6 and 19 pounds, respectively. One of the electric refrigerators showed no change in efficiency, while the other model showed definitely poorer performance. However, several months later this model was again retested and appeared to have returned to its original state. This type of test needs more study before such results can be interpreted in terms of the useful life of the refrigerator.

PUBLICATIONS AND INFORMATION SERVICES

With the addition of the new bulletins issued this year or now in press, the list available to homemakers and consumers from the Bureau totals 35. These are popular interpretations of basic research, as distinguished from the technical publications for the use of scientists. These consumer bulletins deal with practical problems in diet planning, food values, and meal preparation. They translate the findings of the textile chemists into guides for selecting and caring for household fabrics and clothing so as to get full service value. They deal with kitchen planning and choice of household equipment.

The technical contributions form another group. They are issued as bulletins in small editions for distribution to research workers or for deposit in libraries. Progress reports are also contributed to scientific journals.

The following list of new material issued during the past fiscal year includes both types of publications, grouped as contributions to the regular series of the Department, and as articles in outside journals:

DEPARTMENT PUBLICATIONS

- Diets to fit the family income. By R. S. Carpenter and H. K. Stiebeling. *Farmers' Bull.* 1757.
- Home canning of fruits, vegetables, and meats. By Louise Stanley and M. C. Stienbarger. *Farmers' Bull.* 1762.
- Guides for buying sheets, blankets, bath towels. By B. M. Viemont, M. B. Hays, and Ruth O'Brien. *Farmers' Bull.* 1765.
- Homemade bread, cake, and pastry. By F. B. King and A. B. Freeman. *Farmers' Bull.* 1775.
- Fabrics and designs for children's clothes. By C. L. Scott and Margaret Smith. *Farmers' Bull.* 1778. (In press.)
- Quality guides in buying women's cloth coats. By C. L. Scott. Leaflet 117.
- When disaster cuts down home-grown food. Unnumbered. (In cooperation with Extension Service and Resettlement Administration, U. S. Department of Agriculture, and Children's Bureau, U. S. Department of Labor.)
- Menus and recipes for lunches at school. By R. S. Carpenter, H. N. Hann, and F. W. Yeatman. *Misc. Pub.* 246.
- Clothing selection charts. Set of nine black and white charts, each 20 by 30 inches; 40 cents from the Government Printing Office.
- Vitamin content of foods. A summary of the chemistry of vitamins, units of measurement, quantitative aspects in human nutrition, and occurrence in foods. By E. P. Daniel and H. M. Munsell. *Misc. Pub.* 275.

Toxicity of food containing selenium as shown by its effect on the rat. By H. E. Munsell, G. M. DeVaney, and M. H. Kennedy. *Tech. Bull.* 534.

A serviceability test on blankets made from four blends of wool. By M. B. Hays, R. E. Elmquist, and J. I. Hardy. (In cooperation with Bureau of Animal Industry.) *Tech. Bull.* 572.

Family living in Knott County, Ky. By F. M. Williams, H. K. Stiebeling, I. G. Swisher, and G. S. Weiss. *Tech. Bull.* 576. (In press.)

ARTICLES IN OUTSIDE JOURNALS

- Relative vitamin C content of orange and tomato juices determined chemically and biologically. By E. P. Daniel, M. H. Kennedy, and H. E. Munsell. *Jour. Home Econ.* 28: 470-474. September 1936.
- Effect of home canning and storage on ascorbic acid content of tomatoes. By E. P. Daniel and M. B. Rutherford. *Food Research* 1 (4): 341-347. July-August 1936.
- Ascorbic acid content of a number of citrus fruits. By E. P. Daniel and M. B. Rutherford. *Jour. Agr. Research* 54: 689-693. May 1, 1937.
- Contribution to data on the composition of some of the more common vegetables. By Rosemary Loughlin. *Jour. Home Econ.* 29: 255-257. April 1937.
- Grading of eggs and poultry important to consumers. By Louise Stanley. *U. S. Egg and Poultry Mag.* 42: 607, 626, 628, 630, illus. October 1936.

Choose your fruits and vegetables for their food value. By Louise Stanley. *Life and Health* 51 (8): 14, 25, 26-27, illus. August 1936.

Cake-making quality of eggs as related to some factors in egg production. By F. B. King, E. F. Whiteman, and W. G. Rose. *Cereal Chem.* 13: 703-711. November 1936.

The relative value of various lards and other fats for deep-fat frying of potato chips. By F. B. King, Rosemary Loughlin, R. W. Riemenschneider, and N. R. Ellis. (In cooperation with Bureau of Animal Industry.) *Jour. Agr. Research* 53: 369-381, illus. September 1, 1936.

The relation of degree of finish in cattle to production and meat flavors [factors]. By G. A. Branaman, O. G. Hankins, and L. M. Alexander. (In cooperation with Michigan State College and Bureau of Animal Industry.) *Amer. Soc. Anim. Prod. Proc.*, November 27-28, 1936.

The influence of retarded growth in lambs on flavor and other characteristics of the meat. By N. G. Barbella, O. G. Hankins, and L. M. Alexander. (In cooperation with Bureau of Animal Industry.) *Amer. Soc. Anim. Prod. Proc.*, November 27-28, 1936.

Report of the U. S. Department of Agriculture bread flavor committee. By F. B. King, D. A. Coleman, and J. A. LeClerc.

(In cooperation with Bureau of Agricultural Economics and Bureau of Chemistry and Soils.) *Cereal Chem.* 14 (1): 49-58. January 1937.

Some international considerations of the food problem. By H. K. Stiebeling. *Jour. Home Econ.* 28: 653-656. December 1936.

Food consumption of urban and village families at different levels of food expenditure. By H. K. Stiebeling. *Jour. Home Econ.* 29: 6-10. January 1937.

Income regulates the diet. By H. K. Stiebeling. *U. S. Bur. Agr. Econ. Agr. Situation* 21 (6): 19-21. June 1, 1937.

Textile work in the Bureau of Home Economics. By Ruth O'Brien. *Tex-Style* 2 (2): 12-13, illus. November 1936.

Hosiery standards. By Ruth O'Brien. *Jour. Home Econ.* 28: 605-606. November 1936.

Strength produced in different fabrics by various starches and modified starches. By M. S. Furry. *Jour. Home Econ.* 28: 687-690. December 1936.

Ironing as a factor in the deterioration of cotton fabrics. By R. E. Elmquist, and K. M. Downey. *Rayon Textile Monthly* 17 (12): 68-70, 74, illus. December 1936; 18 (1): 81-83, 84, illus. January 1937; (2): 51-53, illus. February 1937.

Classification of sheets as an aid to consumer buying. By M. B. Hays. *Rayon Textile Monthly* 18 (3): 71-72, illus. March 1937.

Progress reports have also been given to the public through press and radio channels.

Preliminary releases giving the results of the consumer purchasing study in small cities, towns, and rural areas—the part of this survey for which the Bureau assumed responsibility—have been going to the press for the last 3 months. These reports covering separate geographical units will be followed by regional summaries as more figures become available, and eventually by interpretative articles calling attention to significant trends in American family-spending habits.

The scope of the weekly Market Basket press release has been altered to fit new economic trends. Started during the depression to aid families in selecting nutritionally adequate diets at the lowest possible cost, it has become an established weekly feature in the metropolitan and rural press. Through this medium the consumer gets news of foods in particular abundance and of special value from the nutritive standpoint, together with suggestions on preparing and serving them so as to retain their important food values.

Active participation has continued in broadcasting talks on radio networks with a Nation-wide coverage. About 150 such talks on network programs have been given by members of the staff during the 12-month period. In addition approximately 200 radio scripts have been vised for syndicating to local stations by the Radio Service of the Department.

The response from these bulletins, radio programs, and releases is an index of the widespread desire on the part of the public for scientific guides to the practical problems of everyday living.

